Improving Medical Performance

(Six Sigma Physiology : DMAIC& DMADV)

Lecture 8

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Wright SHORT ESSAY about Cost of Quality

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Intended Learning Outputs

By the end of this session, participants should be able to:

- Identify & recognize Physiology of Six Sigma " DMAIC "
- Identify The Voice of the Customer
- Identify & analyze The CTQ's
- Identify & recognize Project Charter

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What is Six Sigma

- This is accomplished through the use of two Six Sigma sub-methodologies: DMAIC and DMADV.
  - The Six Sigma DMAIC process (define, measure, analyze, improve, control) is an improvement system for existing processes falling below specification and looking for incremental improvement.
  - The Six Sigma DMADV process (define, measure, analyze, design, verify) is an improvement system used to develop new processes or products at Six Sigma quality levels.

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Both Six Sigma processes are executed by :

Six Sigma Green Belts and Six Sigma Black Belts, and are overseen by Six Sigma Master Black Belts.

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DMAIC Versus DMADV

- The Similarities of DMAIC and DMADV
  - Six Sigma methodologies used to drive defects to less than 3.4 per million opportunities.
  - Data intensive solution approaches. Intuition has no place in Six Sigma -- only cold, hard facts.
  - Implemented by Green Belts, Black Belts and Master Black Belts.
  - Ways to help meet the business/financial bottom-line numbers.
  - Implemented with the support of a champion an**d process owner**

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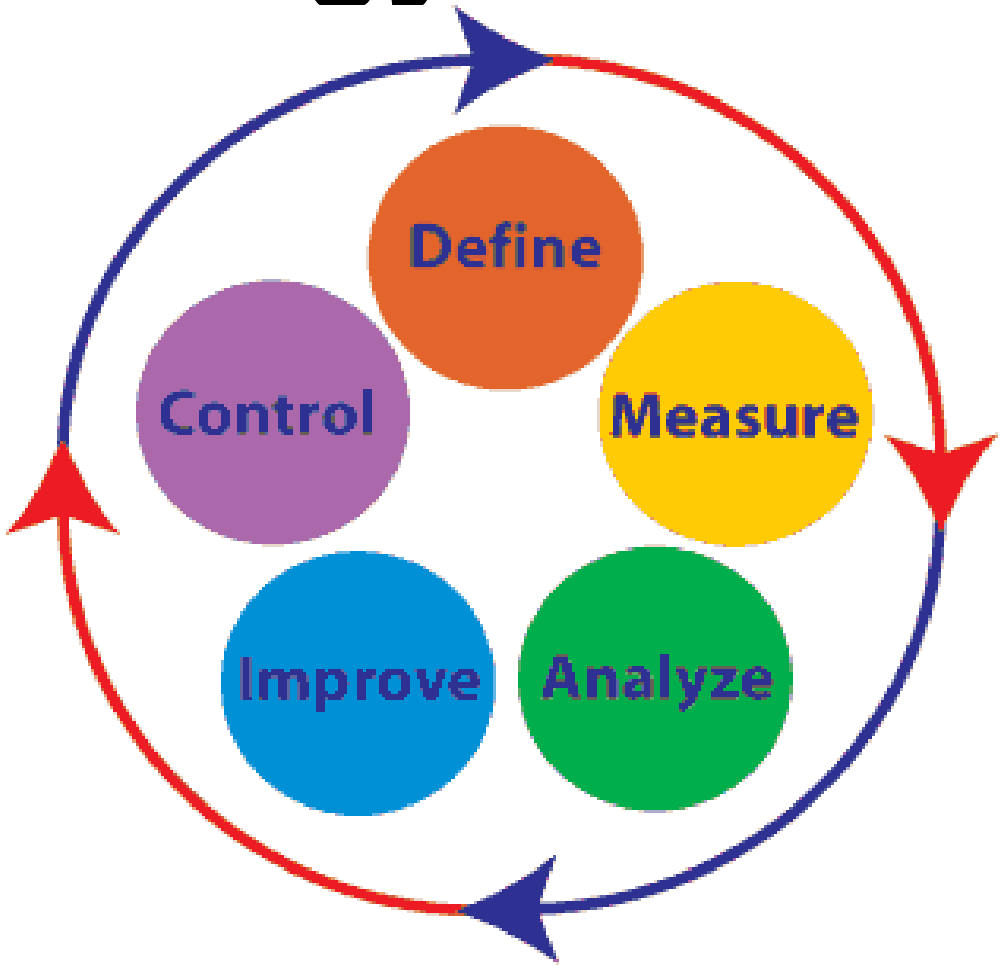
Physiology of Six Sigma



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Six Sigma

LEAN
- Driven by value stream map
- Focused on elimination of waste
- Operationalizes the principles of ESS (**E**liminate, **S**implify, **S**tandardize)

DMADV
- Design methodology
- Utilized to re-engineer or design new processes when existing process is not capable
- Design of brand new processes or services

DMAIC
- Process improvement methodology
- Projects focused on time / cost / quality improvements

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Who Identifies the project?

- Customer satisfaction, quality and savings are *never improved by taking a general approach.*
- An organization enhances all the above by identifying a specific project to work on, making improvements, and then moving to identify the next project.

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Improvement: How to eat an Elephant

- Occasionally, Six Sigma improvement projects appear to be “elephant-sized”; that is, they cover so board an area of activity that they must be subdivide into multiple “bite-sized” projects.

- When this occurs, one project team can be assigned to “cut up the elephant.” Other teams are then assigned to tackle the resulting bite-sized projects. Unless such subdivision takes place, the original team may disband in frustration or take years trying to carry out the board project.

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Six Sigma Methodology

What is important?

- ✓VOC
- ✓Pareto
- ✓SMART Method
- ✓Project Charter

How are we doing?

- ✓SIPOC
- ✓VOC
- ✓Flow Diagram
- ✓Pareto

What is wrong?

- ✓Brainstorming
- ✓Cause& Effect
- ✓Data Collection
- ✓Histogram
- ✓Scatter Diagram

What needs to be done?

- ✓Selection Matrix
- ✓FMEA
- ✓Barriers & Aids Chart

How do we guarantee performance?

- ✓Control Spreadsheet

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DMAIC Approach Define

- **Objectives:**

  Define and scope the improvement project, define customer requirements, prepare teams to be effective project teams and illustrate the business process to be improved.

- **Key Topics:**

1. Identify a project:

a. Nominate projects
b. Evaluate projects
c. Select a project
Ask: Is it quality improvement

2. Establish the project:

a. Prepare a mission statement.
b. Select a team.
c. Verify the mission.

3. Project Charter

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Step 1: Define

Define Suggesting Tools

- Establish the project
- Prepare a Mission Statement
- Select a Project Team
- Voice of the Customer.
- Kano Model
- Project Charter

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Voice of the Customer (VOC)

The importance of VOC:

- To figure out what customers care about
- To set priorities and goals consistent with customer needs
- To determine what customer needs you can profitably meet

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What Do Customers Want?

Quality — Product or Service features, attributes, dimensions, characteristics relating to the function of the product or service, reliability. Availability, test, effectiveness – also freedom from defects, rework, or scrap.

Cost — Prices to customer (initial plus life cycle), repair costs, purchase price, financing terms, depreciation, residual value.

Delivery — Lead times, delivery times, turnaround times, setup times, cycle times, delays.

Service & Safety — Service requirements, after-purchase reliability, parts availability, Service, warranties, maintainability, customer-required maintenance, product liability, product service safety

Corporate responsibility — Ethical business conduct, environmental impact, regulatory and legal compliance.

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- **Listening to the voice of the customer**
  - Select sources of customer information

Sources of customer information

Internal & External data

- Existing company information.
- Industry experts.
- Secondary data.
- Competitors.

Listening post

- Complaints.
- Customer service representatives.
- Sales representatives.
- Billing.
- Accounts receivable.
- Collection.

Research methods

- Interviews.
- Focus groups.
- Surveys.
- Observations.

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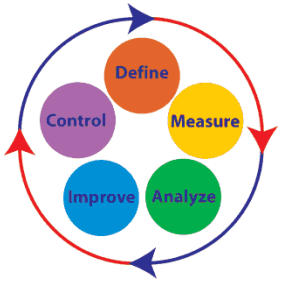
The Project Charter



A project charter typically includes:

- A brief statement of the purpose of the project.
- A summary of the problem to be addressed.
- An objective or specific outcome desired.
- A scope or the aspects of the problem that will be addressed.
- The key milestones or projected conclusion of each of the define

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The Project Charter

Business Case 2	**Opportunity Statement** 1
Goal Statement 3	**Project Scope** 4
Project Plan 6	**Team Selection** 5

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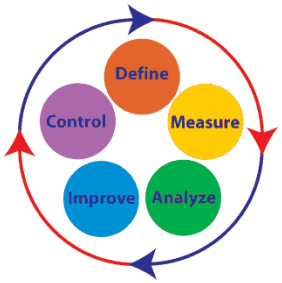

Project Charter Example

Business case

- X-ray retakes for inpatients cases (1063) raise LOS one day more costing the hospital 196,692 *LE/year*
- Cost of X ray films is 49616 *LE/year*
- Total cost is 246308 *LE/year*

Problem Statement

- The average 'X-ray retakes' 23.29% from 1/1/2005 to 31/12/2005 which is high
- The process is currently operating at 2.23 sigma level

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Project Charter Example

Goal Statement

- Reduce the defectives of X-ray retakes to less than 5 %
- Increase sigma level up to 3.5
- Decrease the cost of X-ray retake more than 200000 LE

Project Scope

- X-ray taken process *starts from writing X-ray request by* a *physician & ends by Physician's acceptance of X-ray & its report* Involving Radiology Department

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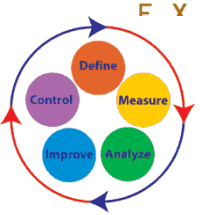

Project Charter Example

Team Selection

- Sponsor: Head of Radiology Department
- Black belt (team leader): Quality Director
- Team member: Orthopedic specialist
- Team member: X-ray specialist
- Team member: Head nurse
- Team member: X-ray technician
- Team member: Purchase Department

Project Plan

- Define 1/1/2006-31/1/2006
- Measure 1/2/2006 - 31/3/2006
- Analyze 1/4/2006-30/4/2006
- Improve 1/5/2006 - 31/5/2006
- Control 1/6/2006 - 30/6/2006

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Example: Team Charter… Delivery of products

Business Case

Our current delivery time average is 72 hours for product X. Customers are requiring delivery in 48 hours. our competitors are meeting the 48-hour requirement. As a result, we are losing 1.5% of our customer base per month for the last 10 months ($75,000/month), new sales are down. 10% for the same 10 months ($60,000/month). By decreasing our delivery time we anticipate the loss of the current customer base to drop below 0.3% (savings=$60,000/month) and new sales will increase 18% above their original base ($108,000).

Opportunity Statement

- We currently have an average "deliver orders" cycle of 72 hours. our customers require it within 48 hours. our process is currently operating at a 2.1 sigma level.

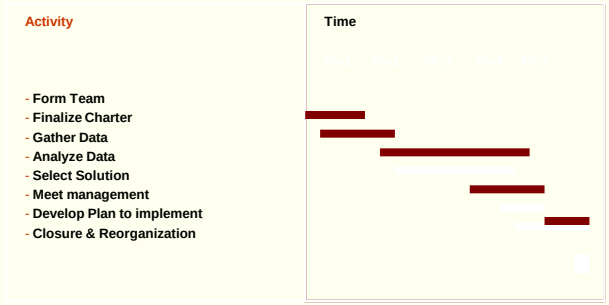
Goal Statement

- Reduce cycle time from call by customer to receipt by customer to 48 hours by fourth quarter.
- Reduce number of defects 10 fold; from 20,000 to 2,000 by the end of the year.
- Increase process sigma to 3.5.

Project Scope

- **Order Processing – Core Process**
  - Start: Call entered into system.
  - Stop: Product in customer's hands
- **Involve all Department**
  - Core Process – related.
  - Enabling process – related.

Project Plan



Team Selection

Barry	Master Black Belt
Carrie	Black Belt
Denise	Dispatch Supervisor
Eric	Senior Dispatcher
Frank	Administrative Manager
Gwen	Truck Loader
Hillary	Truck Loader

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Establish the Project

- **There are three activities on this step:**
  - Prepare a mission statement.
  - Select a team.
  - Verify the mission.

Quality Council

Project team responsibility

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Step 1: Define

1. Identify the process owner/sponsor.

Process owner:

- The person who has authority over how a process operates and ultimate responsibility for the results.

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Step 1: Define

1. <u>Identify the process owner/sponsor.</u>

Sponsor: is responsible for the following:

- Beginning and supporting the project
- Ensuring that all team members fully understand the project and are firmly committed to achieving the results
- Ensuring implementation of the solution
- Removing all barriers to the project
- Being accountable for the performance and outcome of the project

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Prepare a Mission Statement

- The mission statement is the written instruction to the team selected to tackle a quality improvement project. It describes:
  - **The problem to be resolved.**
  - **The objective of the project.**
- Criteria for Describing the problem
  - **Specific.**
  - **Observable.**
  - **Measurable.**
  - **Manageable.**

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Example

- Our company's procedure for shipping replacement parts takes ten days longer on average than our major competitors take.
  - This statement is:
    - Specific.
    - Observable.
    - Manageable.
    - Measurable.

This is the problem

These are symptoms or consequences of the problem

Problem: Too many computer programs must be rewritten during each installation project. On average, 50 percent of all programs must be rewritten at least once and this causes the project team to miss project deadlines and exceed project budget estimates by wide margins.

Business Case

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Pitfalls to Avoid

- A mission statement should not:
  - **Imply a cause.**
  - **Suggest a remedy.**
  - **Assign blame.**

- ***Implying a Cause***: this misleads the team

  Example

  Our company's procedure for shipping replacement parts takes ten days longer, on average, than our major competitors take. **Eliminate the delays in documentation before the replacement part is shipped.**

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Pitfalls to Avoid

- *Suggesting a Remedy:* **if a remedy is set without knowing the cause, it will lead to failure.**

  Example

  Our company's procedure for shipping replacement parts takes ten days longer, on average, than our major competitors. **Install a computerized shipping log to speed up the process.**

- *Assigning Blame:* **this reduces individuals' willingness to participate in solving the problem**

  Example

  The shipping department needs to improve its work procedures to reduce the time needed to ship replacement parts.

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Step 1: Define

2- Select a Project Team

- composed of **cross-functional** groups of people who share the problem and represent various places in the work flow.
- **For example,** to remove delays in the process for taking X-rays, a team would, at a minimum, have members from a Nursing Unit, Transport, Radiology, and the Medical Staff.

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Step 1: Define

Guidelines for Team Selection

- Where the problem is observed or the pain is felt.
- Where sources or causes of the problem might be found.
- Among those with special knowledge, information, or skill in uncovering the root cause of this particular problem
- In areas that can be helpful in implementing the remedy

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Step 1: Define

Benefits of the Cross-functional Team Appr

- Team involvement promotes sharing of the problem and minimizes "finger pointing."
- The diversity of team members brings a more complete working knowledge of the process to be improved
- Representation from various departments promotes the acceptance and implementation of change throughout the organization

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Step 1: Define

- **Listening to the voice of the customer**
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Sources of customer information

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Listening post

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Research methods

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Step 1: Define

Observation

- **Purpose**

  The key is **to watch how your customers use** your product or service at their location **or** at any point where they interact with your company

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Step 1: Define

Interview

- **Purpose**

To learn about **a specific** customer's point of view on service issues, product/service attributes, and performance indicators/measures

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Step 1: Define

Focus Group

- **Purpose**

  To get **feedback on existing products or services** or on **proposed ideas** from the point of view of **a group** of customers

Dr. Mahmoud M. El Damety
drdamaty@aucegypt.edu

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Step 1: Define

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Survey

How to do customer interviews

- Develop survey objectives.
- Determine the required sample size.
- Write draft questions and determine measurement scale
- Design the survey.
- Conduct a pilot test.
- Send out survey (mail, fax, email attachment)

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VOC

External Customer

VOC	CCR	CTQs	Targets
Did not want wrong surgery	Right surgery	Accurate Patient identification	Incidence = Zero%
Redo right surgery in a second time	Right surgery From first	Accurate Patient identification	Incidence = Zero%
Having risk of surgery twice	Right surgery From first	Accurate Patient identification	Incidence = Zero%
-Bad staff behavior	Good care	Patient & family rights	Improvement by 90%
-Knowing everything	Transparency& disclosure of faults	Patient & family rights	Follow IPSG
-Caring of medical staff	Good care	Patient & family rights	Follow IPSG
-Skillful surgeon	Highly qualified surgeon	Highly qualified & experienced surgeon	Follow IPSG
Details of consent	Trust & assurance	Patient & family rights	Follow IPSG
Seeing surgeon before surgery in OR	Trust & assurance	Patient & family rights	Follow IPSG

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VOC

Internal customer

VOC	CCR	CTQs	Targets
Performance in OR	Good performance	Protocol	Protocol is successfully followed with less 1% error
OR schedule	Reasonable schedule	Conforming OR scheduling	No delay
Distraction & rushing	Clear role	Definite role	Clear responsibilities
Personal deployment	Reasonable work	No overload work	No interference
failure to complete appropriate task	Education	Training	100% complete tasks
Placement of IT in OR	Equipment rearrangement	Optimum arrangement	Decrease number of c/o to 95%

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Step 1: Define

Kano analysis

Requirement Types:

- **Must - Be (Dissatisfies):** Requirement that can dissatisfy, but cannot increase satisfaction.
- **Primary (Satisfiers):** the more of these requirements that are met, the more one is satisfied.
- **Delighters (Attractive Qualities):** if the requirement is absent, it does not cause dissatisfaction, but it will delight clients if present

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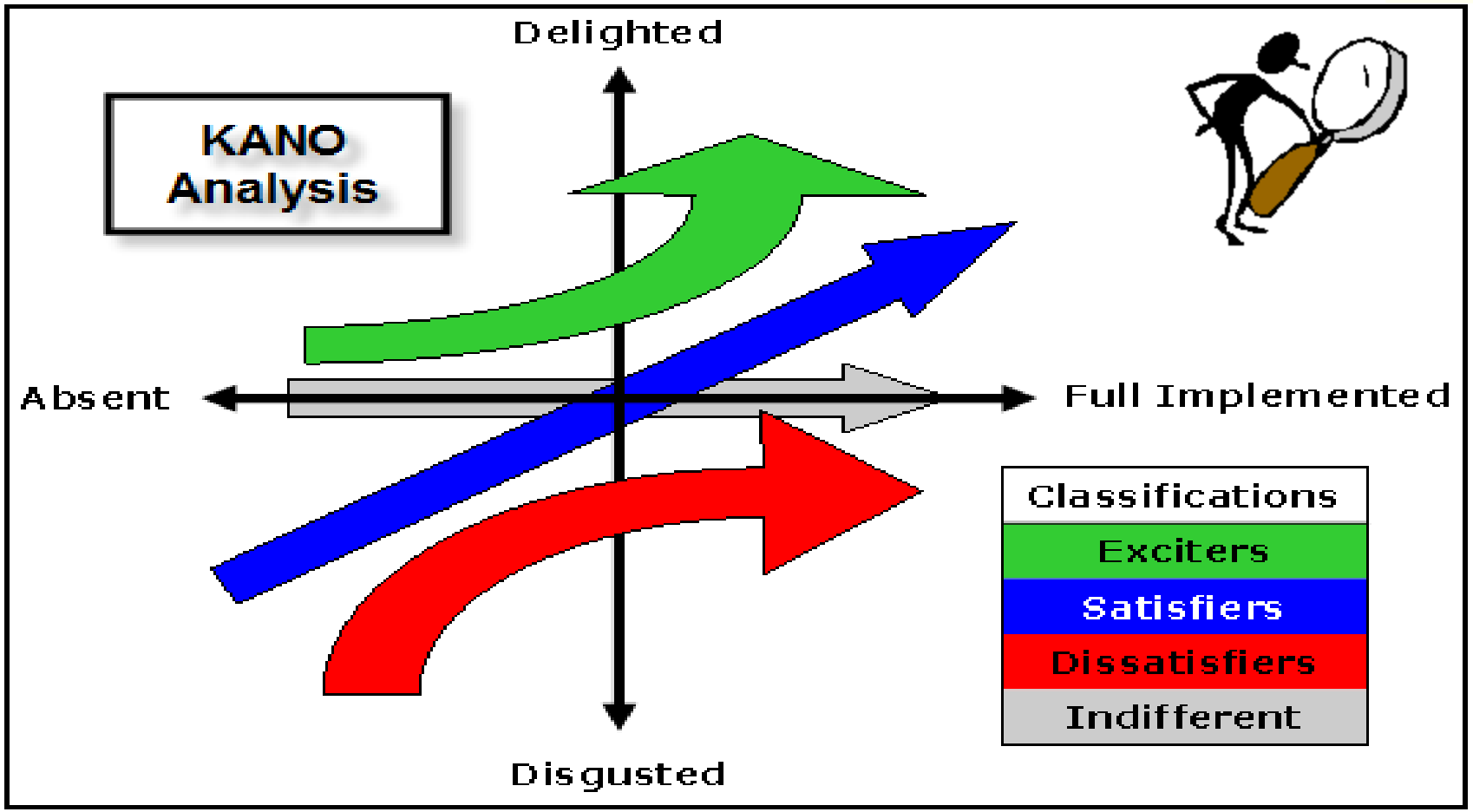

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The Project Charter

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One Page Exercise

Q 2:

A. Mention benefits of cross functional teams

B. Mention Differences between the focus groups & Surveys

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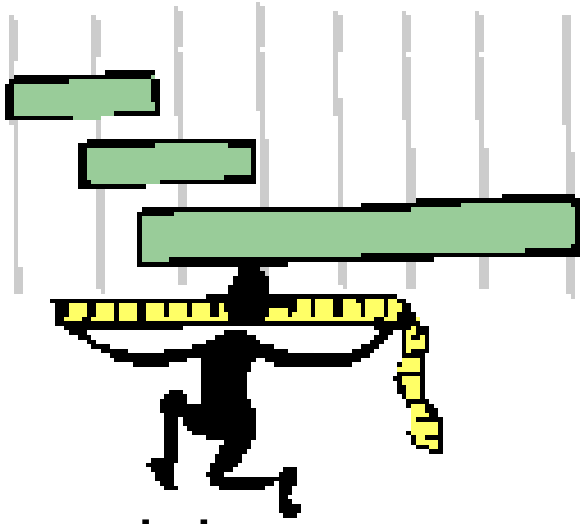
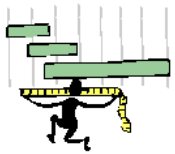
Step 2: MESURE



To understand the current state of the process at detailed level to understand decision points



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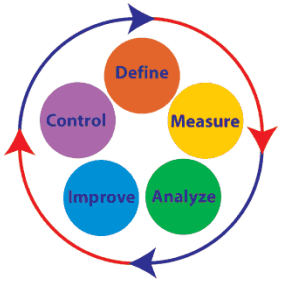
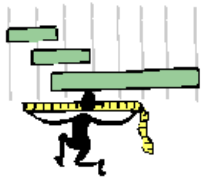
Measure Main tools:

- SIPOC
- Process Map.
- Data Collection.
- Sampling Techniques
- Control chart.
- Sigma level.





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1-SIPOC

- **S**uppliers: those who provide inputs for process.
- **I**nputs: data, knowledge, resources necessary for process to generate desired output.
- **P**rocess: activity that transforms inputs to outputs.
- **O**utputs: result of process (deliverables).
- **C**ustomers: person or function receiving outputs

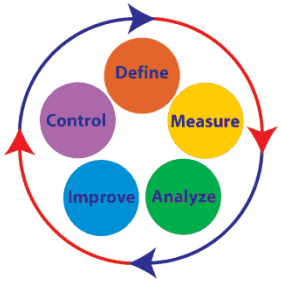

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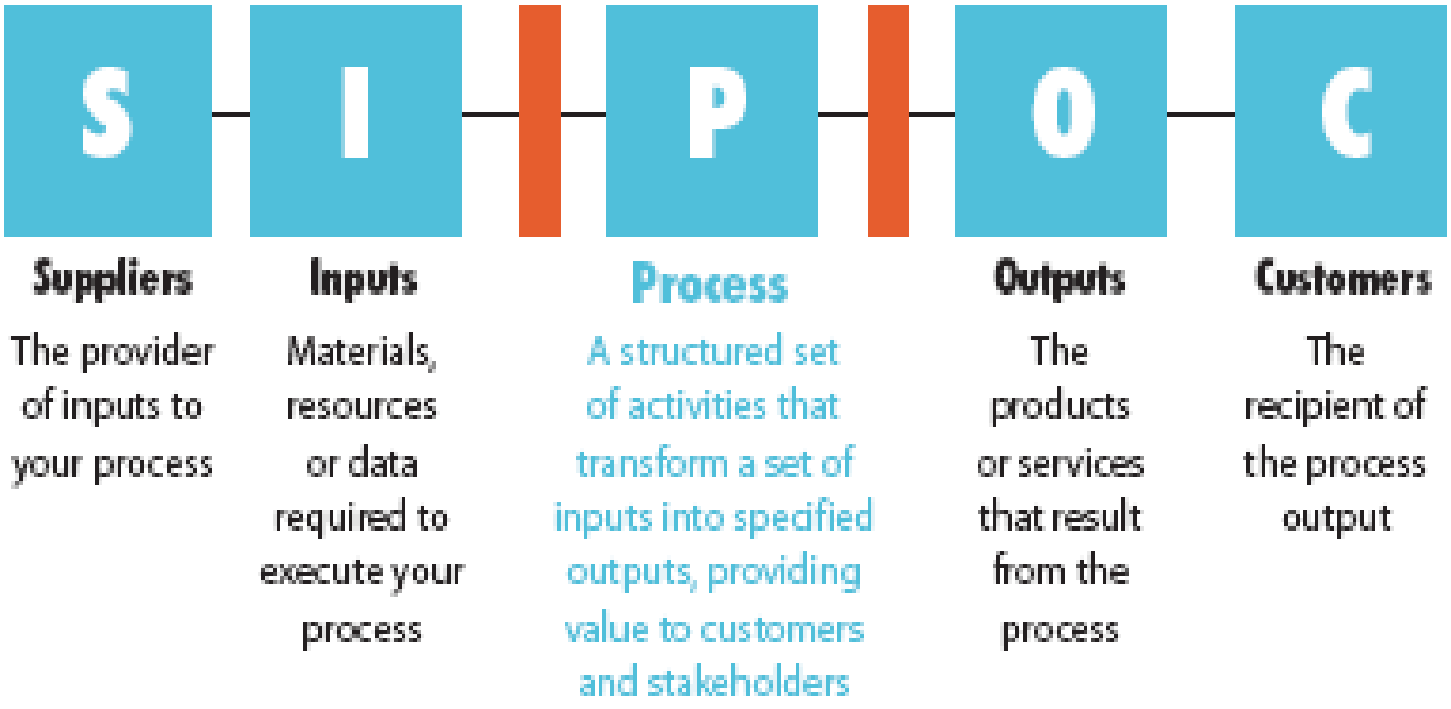
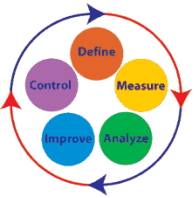
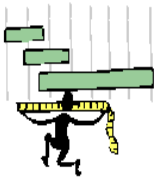
Figure 1. SIPOC – understanding processes







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SIPOC

Process : Assessment of performance from time of patient enters OR until leaving it				
Purpose : Measurement of actual performance				
Owner : Operative theater staff				
Suppliers	Input	Process	Output	Customer
-Nurse	-Medical record -Documentation -ID band -Sign in check list	-Inaccurate sign in without full participation of all team	-Patient ready for anesthesia	Anesthesiologist
-Anesthesiologist	-Equipment -Drapes -solutions -Medications	Patient is ready on the OR bed	-Patient &surgical team is ready to go	Surgeon
-Nurse	-Medical record -Documentation -ID band -Time out check list	-Perform timeout in rush with missing items	-GO Signal for surgery	Surgeon
-Surgeon	-OR skills -OR equipment -Tools	-Surgical procedure is performed on wrong- site	-Completed surgery	Patient
-Nurse	—Medical record -Documentation -ID band -Sign out check list	-Perform sign out	-Completed documentation	Quality & safety management center

Boundaries	
Start point: Patient enters the OR	End point: Patient leaves the OR

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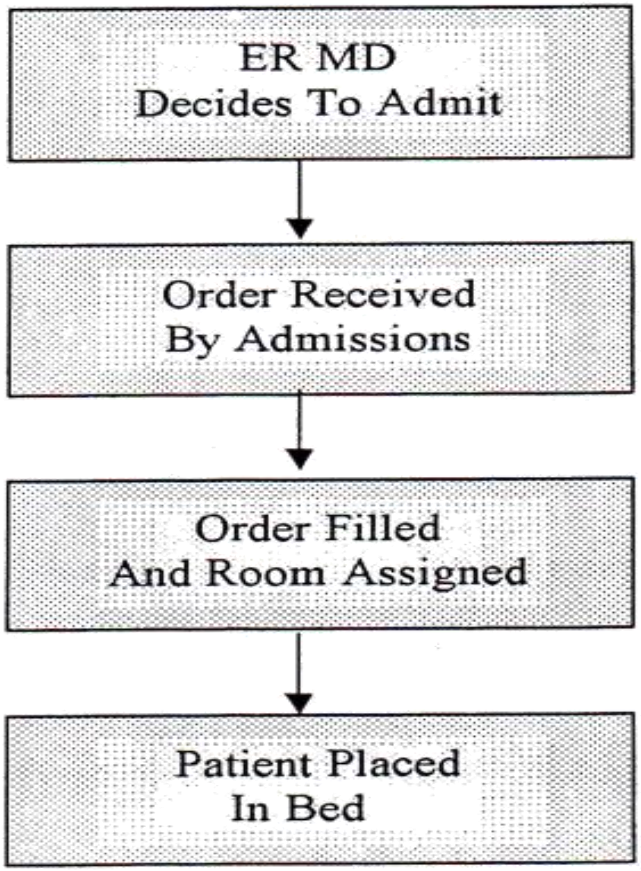
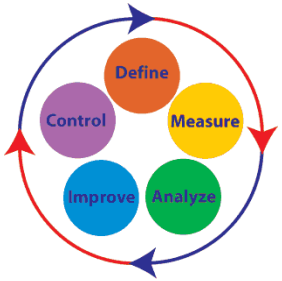
High level Flow Diagram – Admission for ER





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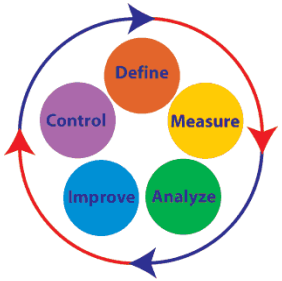
2-Flow Diagram

** A graphic representation of the sequence of steps in a given process .



With a flow diagram,
a breakthrough improvement team can
"walk through" a process.

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SYMBOLS USED IN FLOW DIAGRAMMING

The **activity symbol**

The **decision symbol**

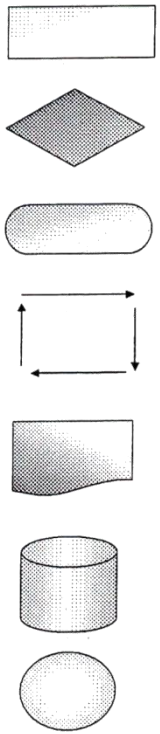
The **terminal symbol**

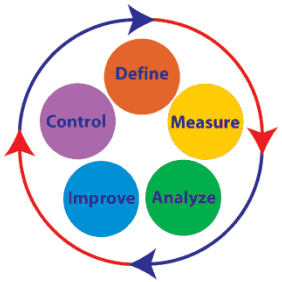
The **Flow lines**

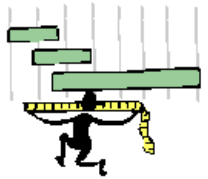
The **document symbol**

The **database symbol**

The **connector**







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Data Collection Plan

Project name	Six sigma breakthrough project to improve patient safety by zero% wrong site surgery				
Process name	Decrease wrong-site surgery by zero % through increase compliance with SSCL				
Data plane prepared by	Head of surgery department				
Period from and to	1/2/2014 TO 30/4/2014				
Variable name	Operational definition	Who is responsible for the collection	When data is be collected	How data is collected	Where data is collected
ambiguous Site marks	Marked site is visible & single for all OR team	Circulating nurse	Before induction of anesthesia	Data should be recorded on data collection form	Operative room
Verification of essential patient information	-Circulating nurse ask patient about ID, site, procedure, consent, -Confirmation verbally with all OR team	-Circulating nurse -Anesthesia team -Surgeon	-Before induction of anesthesia -Before skin incision	Data should be recorded on data collection form	Operative room
Problem in OR scheduling	Accurate information for OR scheduling	Head of OR	During all day surgery	Data should be recorded on data collection form	Operative room

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Step 3: Analyze

OVERVIEW OF THE ANALZE PHASE

- Once the MEASURE phase identifies what is happening (Y's), the next issue is to discover *why* it is happening (what are the **root** causes) (X's).

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Step 3: Analyze

Analyze Tools

- Brainstorming
- Cause – effect diagrams
- Why, why diagrams
- Pareto diagram
- Histogram
- Scatter diagram

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Step 3: Analyze

Quality Tool: Brainstorming

- A quality tool for generating innovative ideas on a given topic
- **When to use:**
  - Nominate projects
  - Develop theories about possible causes of problems
  - Identify potential remedies
  - Identify potential resistance to remedies

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Step 3: Analyze

Quality Tool: Cause - Effect Diagram

- A cause-effect diagram (C-E) helps a project team to organize existing theories about causes and to develop new ones.
- A cause-effect diagram cannot identify a root cause; it -simply presents graphically the many causes (X*s) that might contribute to the observed effect (Y).
- This graphic presentation helps focus the search for the root cause and contributes to the team's understanding of the problem.

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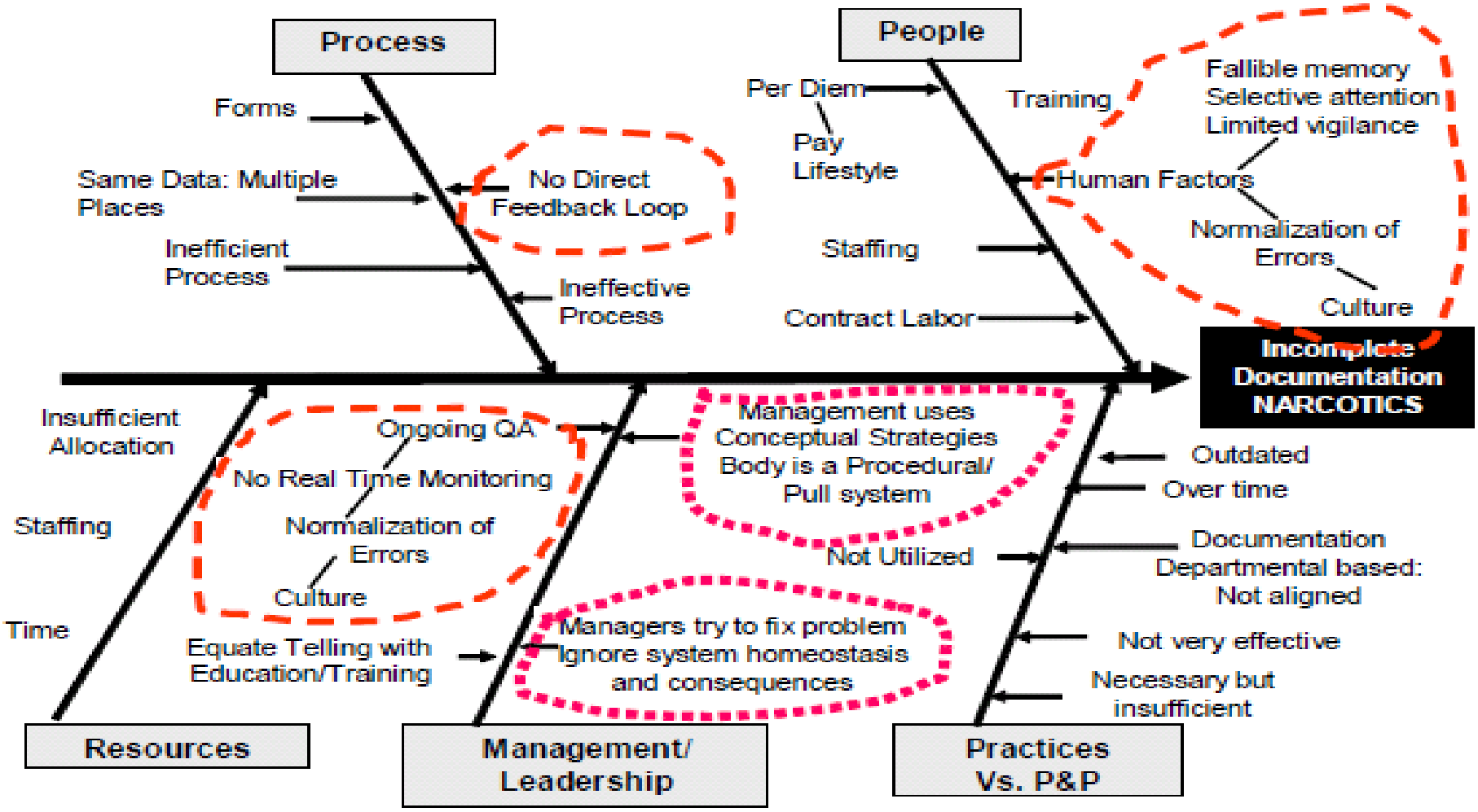
Step 3: Analyze

Quality Tool: Cause - Effect Diagram



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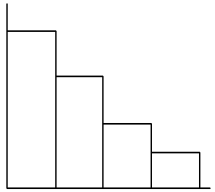
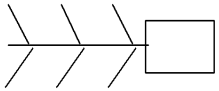
Tools Used in Root Cause Analysis

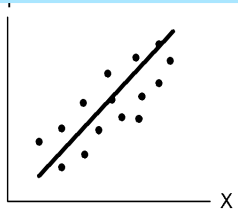
BRAINSTORMING



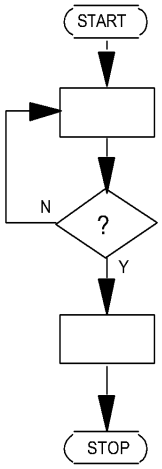
PARETO CHART



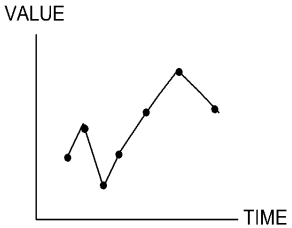
FISHBONE DIAGRAM



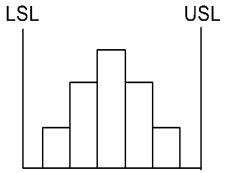
SCATTER DIAGRAM



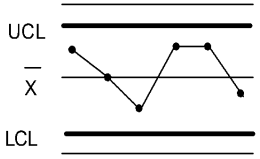
FLOWCHART



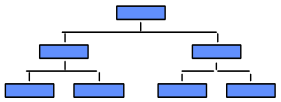
RUN CHART



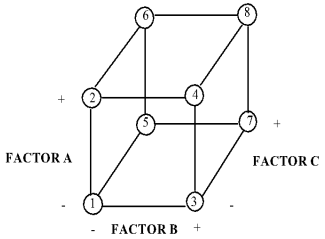
HISTOGRAM



CONTROL CHARTS



TREE DIAGRAM



DESIGN OF EXPERIMENTS

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5 Whys Diagram

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Example

- The patient's diagnosis of skin cancer was considerably delayed. **Why?**
- The excision biopsy report was not seen by the surgeon. **Why?**
- The report was filed in the patient's notes without being seen by the surgeon. **Why?**
- It was the receptionist job to do the filing. **Why?**
- The junior doctors were busy with other tasks. **Why?**

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Pareto Principle

In the early 1950s, Dr. Joseph Juran noted the "universal" phenomenon that he has called the Pareto principle: that in any group of factors contributing to a common effect, a relative few account for the bulk of the effect

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PARETO DIAGRAMS

- It puts data in a hierarchical order which allows the most significant problems to be correct first
- Quality experts often refer to the principle as the **80-20 rule**; that is, **80%** of problems are caused by **20%** of the potential sources.
- To create a Pareto diagram, the operator collects random data, regroups the categories in order of frequency, and creates a bar graph based on the results.

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Impact matrix for external customers

External Customers	Criteria					Total
	New business opportunity	Reputation	Total revenue	Ability to shut down	Competition Ranking	
Patients	9	9	9	3	9	39
Patients' families	91	9	3	0	9	30
Referring Physicians	3	3	3	0	1	10
Ministry of Health (MOH)	3	9	3	9	9	33
Payers (insurance companies)	0	3	0	3	3	9
Regulators	1	1	0	9	0	11
Community	1	0	0	3	3	7
Media	0	1	0	1	9	11
Syndicates	3	3	1	1	0	8
Health insurance organization (HIO)	9	9	3	0	9	30
Suppliers(57357 Hospital)	1	9	3	0	3	16

9 = Major impact 3 = Moderate impact 1 = Small impact 0 = No impact

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Item	frequency	cumm	Cumm %
Patients	39	39	18.9
MOH	33	72	35.0
HIO	30	102	49.5
Patient's families	30	132	64.1
Suppliers	16	148	71.8
Media	13	161	78.2
Regulator	11	172	83.5
Referring physicians	10	182	88.3
Payers	9	191	92.7
Syndicates	8	199	96.6
Community	7	206	100
	206		

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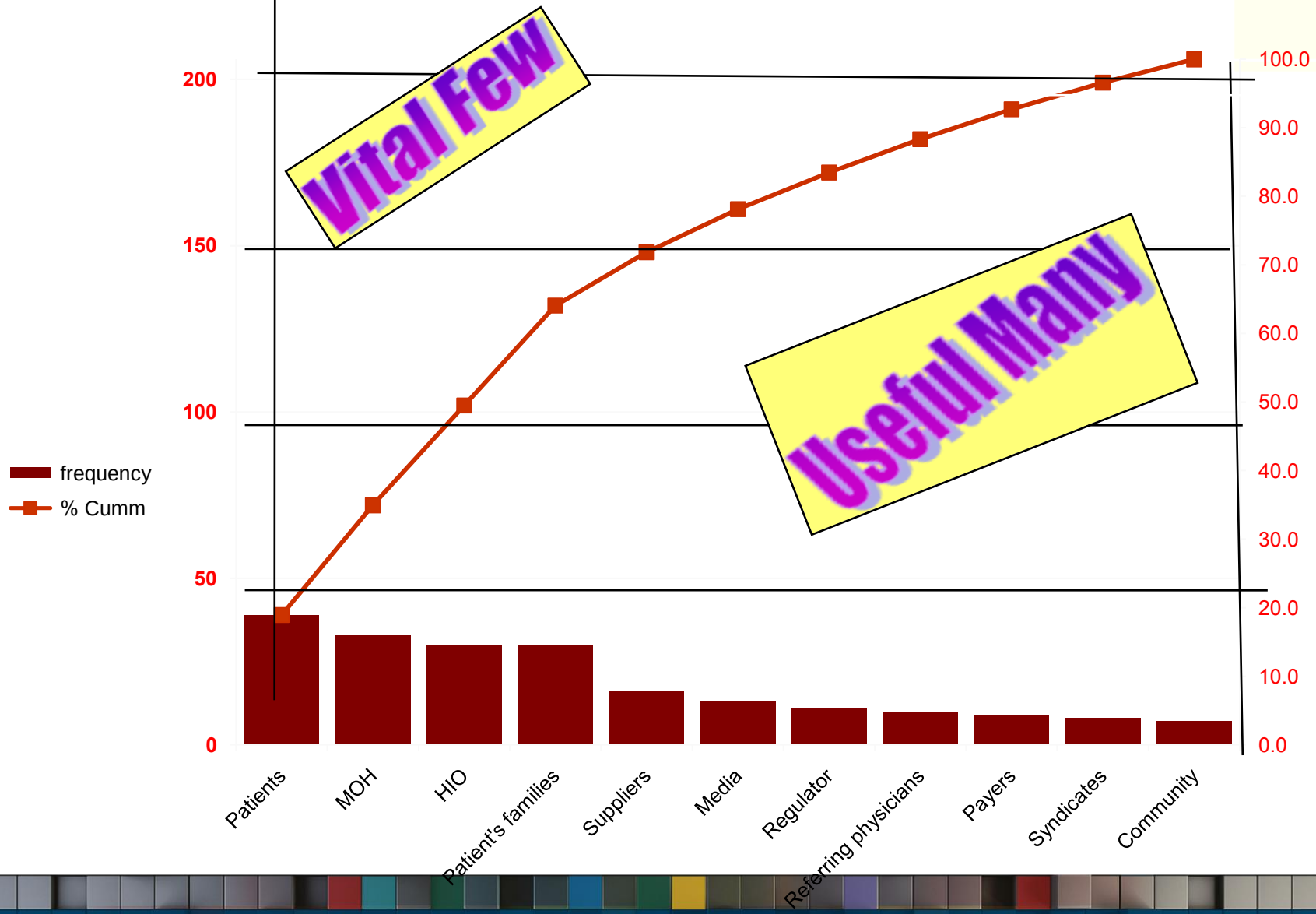

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HISTOGRAMS

A histogram is a graphic summary of variation in a set of data.

The pictorial nature of the histogram enables us to see patterns that are difficult to see in a simple table of numbers.

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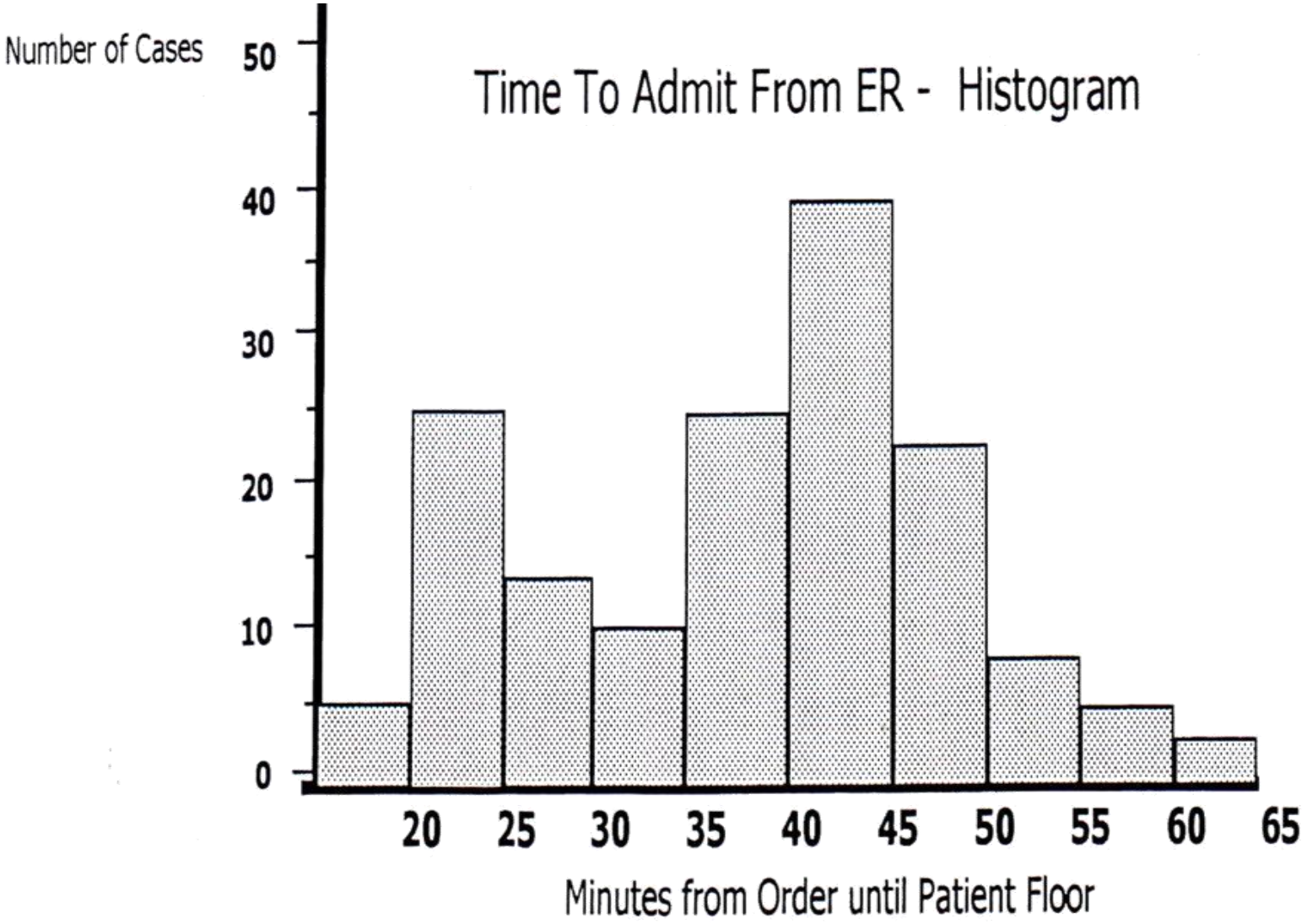

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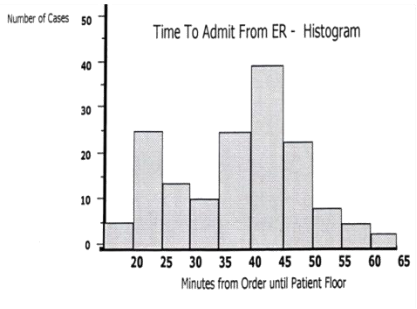
Each bar relates to a span of time required to complete the admission (15 to less than 20 minutes, 20 to less than 25 minutes, and so on).

These 5-minute time spans are called cells. The height of each bar indicates the number of admissions within a cell.

For example, for five patients, it took from 15 to less than 20 minutes to complete the admission.



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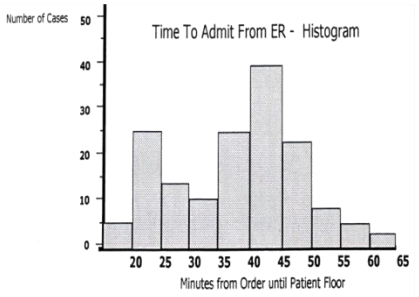
The two peaks in the histogram (between 20 and 25 minutes and between 40 and 45 minutes) suggest that two different processes are at work.

Possible different processes include: different times of day, different days of week, different levels of case activity, or census level in hospital.



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HISTOGRAMS

- It is a representation of a frequency distribution by means of rectangles whose **widths** represent class intervals & whose **areas** are proportional to the corresponding frequencies
- **We decide the number of cells according to data points:-**

20 – 50	6 cells
51 – 100	7 cells
101 – 200	8cells
201 – 500	9 cells
501 – 1000	10 cells

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DATA FOR HISTOGRAM

122	69	170	50	31	49	115	55	175	190
125	101	115	80	117	78	60	145	140	60
91	80	110	119	145	109	170	88	175	160
61	145	147	200	69	160	115	205	57	57
90	88	75	150	110	105	140	105	59	130
98	120	105	85	158	135	86	175	90	175
124	180	152	107	115	105	106	150	145	165
66	70	65	195	77	190	185	185	170	55
100	150	116	90	130	189	190	89	165	121
140	120	145	120	118	85	103	180	150	120

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Range = 205-31 = 174

Cell Width = 174 ÷ 7 = 24.86 ≈ 25

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When to Use Histograms

- Testing Theories
- Proving Effectiveness

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Scatter Diagrams

A scatter diagram is a graphic presentation of the relationship between two variables. In quality improvement, scatter diagrams are usually used to test cause-effect relationships in the diagnostic journey.

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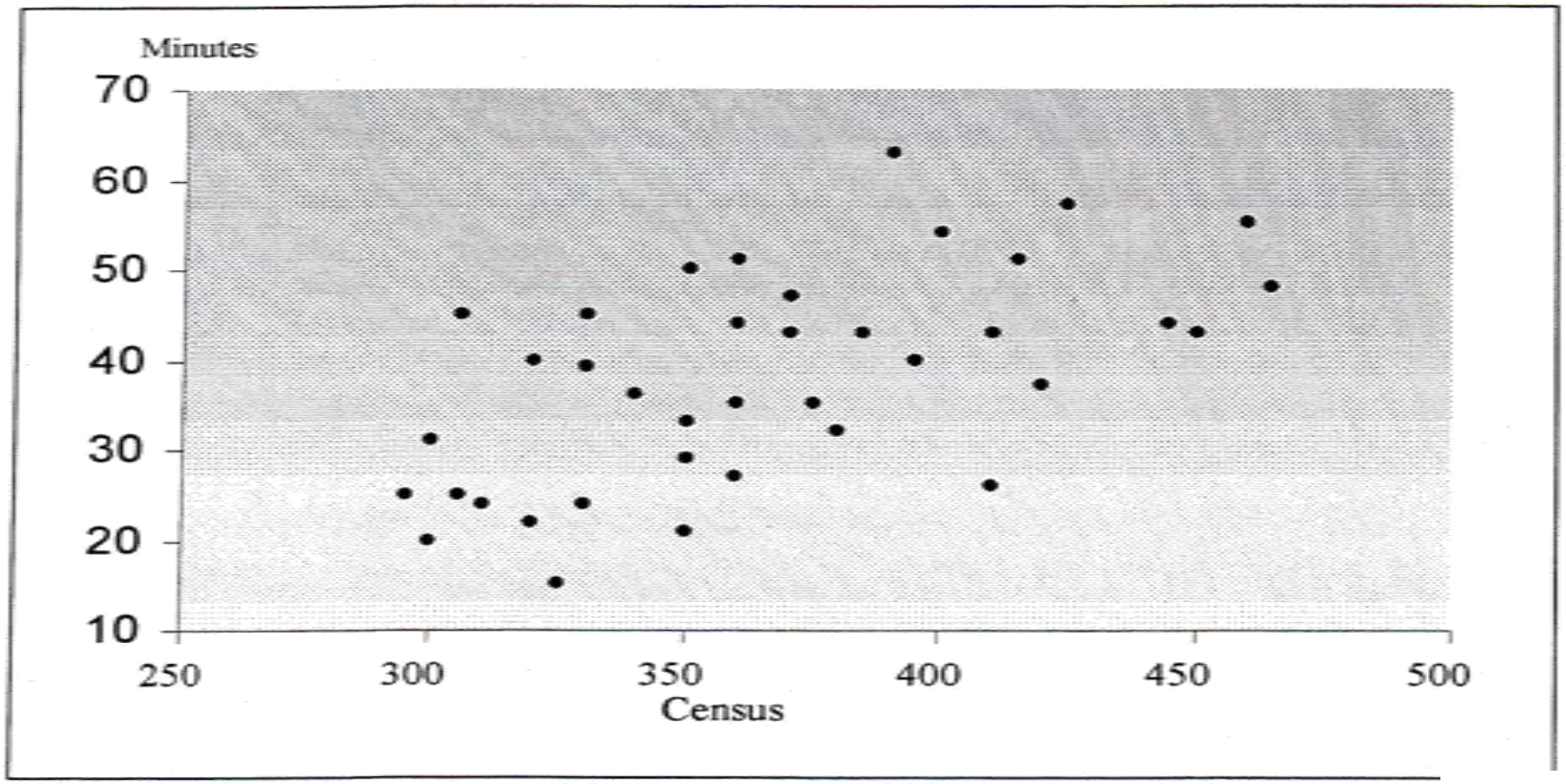
Time to Admit From ER & Hospital Census – Scatter Diagram



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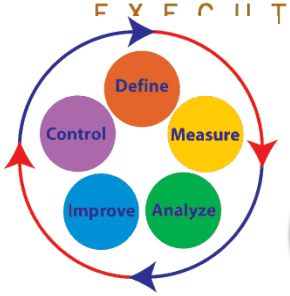

Step 4: Improve (Remedy the Cause)

- Once root causes (X's) of the problem are proven with evidence, the team designs changes to the process that will remove the cause (Xs).
- Through plan the rollout of the improvement, including how to prevent or overcome resistance to the changes required by the improvement

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Suggesting Quality Tool:

1. Remedy Selection Matrix.
2. New process map
3. Tree diagram.
4. Planning matrix.
5. Force Field Analysis or Aids & Barriers Chart

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Improve Phase requires five activities:

1. Evaluate alternatives.
2. Design remedy.
3. Design for culture.
4. Prove effectiveness.
5. Implement.

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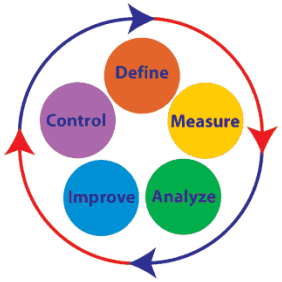
Evaluate Alternatives

- Brainstorming is often helpful at this point.
- Once project team members have identified many possible improvements, they should evaluate each one in terms of its probable impact on the problem and on the organization.



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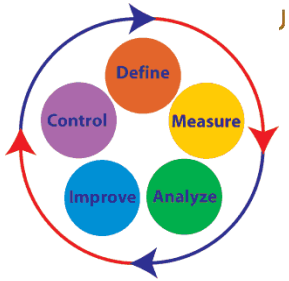
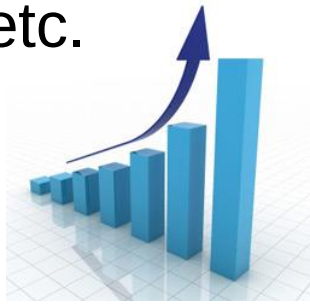


Developing and using evaluation criteria

- Customer requirements (CTQs)
- Process or Output Impact—how well will this solve the problem?
- Customer satisfaction
- Business needs
- Alignment with strategy
- Impact on time, operating costs, market share, etc.
- Capital investment
- Risk to implemen



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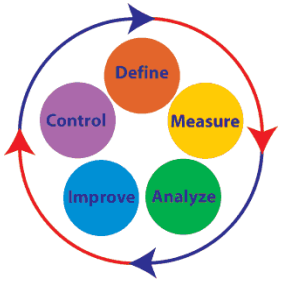
Weighting criteria

Not all criteria are created equal.

When evaluating alternatives, it's best to weight the criteria by assigning numerical values that indicate relative importance.



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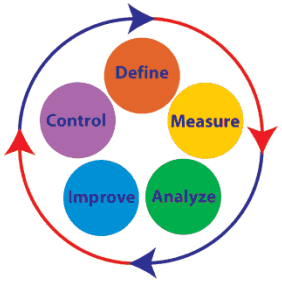
Quality Tool: Remedy Selection Matrix

Purpose :

-To document the solution selection process and criteria

-To make sure the solution selected for implementation provides the best chance for meeting the project goals



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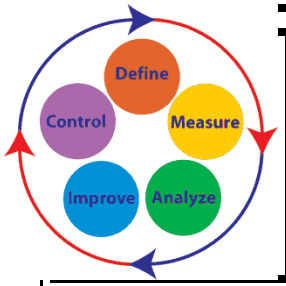
Remedy Selection Matrix



	Process Impact	Time	Cost vs. Benefit	Other	Total Score	Rank
Weight	2	2	3	1		
Opt 1	8	8	10.5	4	26.5	2
Opt 2	14	18	22.5	7	32.5	1
Opt 3	2	4	21.0	1	28	3

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Remedy Selection Matrix

The team can use this matrix in a number of ways. For example:

- ✓ Each team member can complete a matrix and then have someone average the ratings of all team members.
- ✓ The team can discuss each criterion and reach consensus on the rating for each proposed remedy.

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Design the Remedy

Once the team selects a remedy, it designs the remedy by performing four tasks:

1. Ensure that the remedy achieves project goals.
2. Assess human resource requirements
3. Specify the procedures and other changes required
4. Determine the required resources

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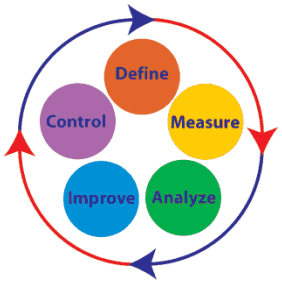
There are several quality tools useful when designing a remedy. These include the following:

1. Flow diagram.
2. Tree diagram.
3. Planning matrix.



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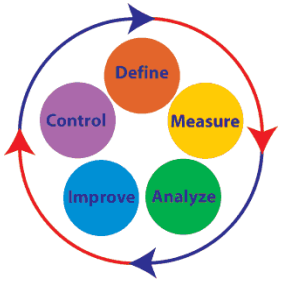
New process mapping (Flow Diagram)

This visual presentation helps the team clarify the proposal, identify any gaps or ambiguities in the design, and explain the remedy to others.



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Tree Diagram

While a flow diagram may be used to show how a remedy will operate when completed, a tree diagram outlines the steps for implementing a remedy by listing all the basic tasks needed to achieve that outcome

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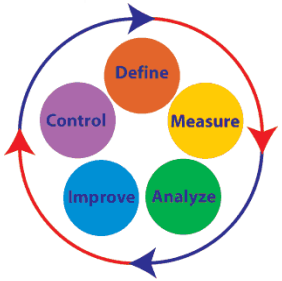
Tree Diagram

New Medical – Record Tracking Procedures – Tree Diagram



- **New medical-Record tracking process**
  - Use new out-guides
    - Design new guides
    - Order & inventory
  - Use new medical record covers
    - Design new covers
    - Order & inventory covers
    - Install covers
  - Computer prints Out same-day Appointment slips
    - Specify system change
    - Write new program
    - Test
    - Install
  - Medical record Staff inserts same-day slips and uses them
    - Write procedure
    - Prepare training
    - Conduct training
    - Conduct dry run

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Planning Matrix

A Planning matrix assigns :

1- Each task in a tree diagram to an individual, group, or department.

2-The matrix specifies who will complete each step and when.

3-It may also specify for each step that will help, what the budget will be, who the team contact is for work done outside the team, the status of the task, etc

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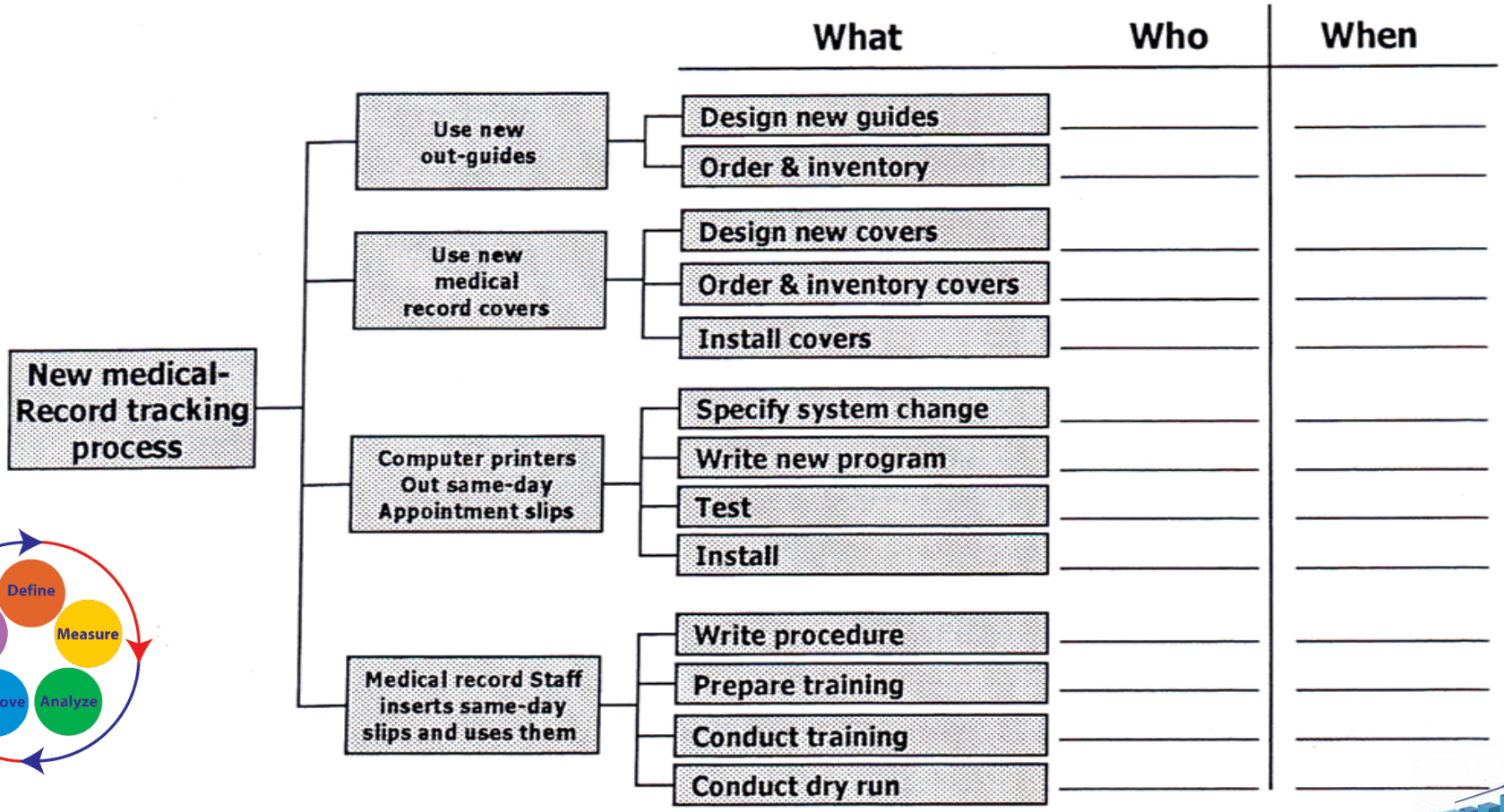
Planning Matrix

New Medical – Record Tracking Procedures – Tree Diagram with Planning Matrix



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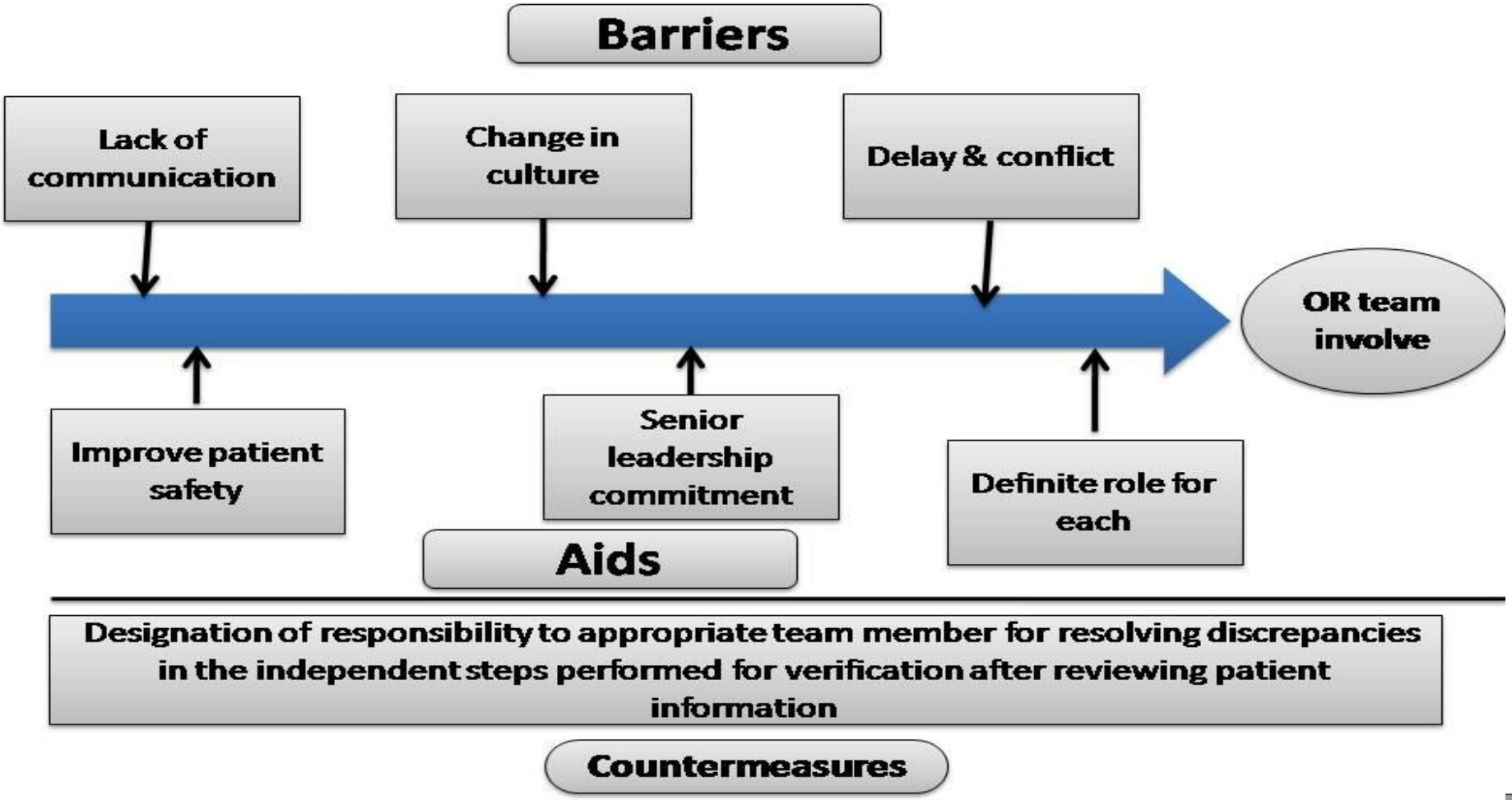
Barriers & Aids Chart for OR team involve


Barriers
Lack of communication
Change in culture
Delay & conflict
OR team involve
Improve patient safety
Senior leadership commitment
Definite role for each
Aids
Designation of responsibility to appropriate team member for resolving discrepancies in the independent steps performed for verification after reviewing patient information
Countermeasures

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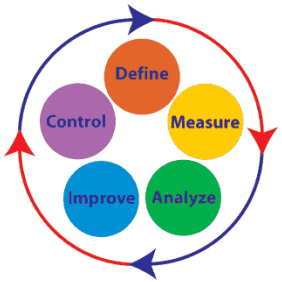
Design for Culture
Dealing with Resistance

The key to coping with resistance is to understand the needs of people who are affected by change and actively take steps to address their issues.



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Design for Culture
Dealing with Resistance

Resistance to a proposed improvement should be a signal that something may have been missed:

1-Mistakes might have been made,

2-Concerns not satisfactorily handled

3- A proposal inadequately presented and consequently misunderstood.

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Step 5: Control

CONTROL involves measuring actual performance *(actual* Y), comparing it to the desired performance (a standard, a *desired* Y), and taking actions on the difference.

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Suggesting Quality Tool:

1. Control Spreadsheet.
2. Control chart.
3. Audit the Controls
4. Mistake Proofing (Poka Yoke)
5. Failure Mode and Effect Analysis(FMEA)

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Quality Control Spreadsheet

Control Variable	How measured	Where measured	Standard	Who analyzes	Whoacts	What done
Minutes in waiting room	Difference between appointment time and time seen by physician	Reception area	7 (Seven) minutes maximum	Receptionist	Clinic administrator	➢Check staff and ➢equipment Status. ➢Check status of changing Rooms. ➢Advise technicians/ ➢Radiologists.

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Failure Mode And Effect Analysis

FMEA

1- Item: Wrong-site surgery
2-Analysis engineer: Quality specialist
3-Function: Identification of surgery site
4-Orginal date: June 2014

Process step / Input	Potential failure mode	Potential failure effect	Potential causes	Occurrence	Severity	Detection	RNP	Design action	Design validation
(1) Ambiguous site mark	(A) -Invisible mark -More than one mark -Washed mark	-Wrong site surgery -Delay in procedure	Awareness to safety — Compliance to safety	10	10	5	500	The surgeon mark the site by himself using his initial	Coordinator marked on the white board
	(B) -Wrong positioning	-Wrong side surgery -Delay in procedure	-Type of surgery -Delayed surgeons	1	10	1	10	-Scripting process (Do Not Start) -Scrub nurse does not hand instrument	Coordinator marked on the white board
(2) - Inadequate patient verification by team	(A) -Wrong in MR -Consent not addressed	-Wrong site surgery -Delay in procedure	-No full participation of team -Rushing in OR	5	10	1	50	-Scripting process (Do Not Start) -Scrub nurse does not hand instrument	Coordinator marked on the white board
	(B) -Incomplete Documentation -Absent of required documents	-Wrong site surgery -Delay in procedure -Communication with OR team -Patient not included		10	10	1	100	-Scripting process (Do Not Start) -Scrub nurse does not hand instrument	Coordinator marked on the white board

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Document Controls

Cleary document all the critical elements of the control process so they can be effectively audited.

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Formal Assignment 5

Wrong Site Surgery Case Study, teamwork.

- As a six Sigma Breakthrough Project
- **Each TEAM** will bring a HARD COPY Next Session

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Informal assignment 9
(to be sent by MAIL ONLY+ Individual)

Please Read & Demonstrate Briefly :

1. LEAN Thinking,GEMBA,Kaizen,8 wastes, Spaghetti Diagram, 5 S' s , Lean six Sigma in Healthcare

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